CLAIMS

What is claimed is:

1. A method of recognizing and compressing an image for transmission such that a requirement for transmission of the image is reduced while maintaining target-specific utility of the image, comprising:

defining a first object class having a first object criteria that is at least partially related to the target-specific utility of the image;

recognizing an object within the image as a member of said first object class if said object substantially meets said first object criteria of said first object class; and

compressing at a first coding rate a first region of the image having said object recognized as said member of said first object class, said first coding rate providing a first coding resolution of said first region that is greater than a second coding resolution provided by a second coding rate for the image.

2. The method of Claim 1, further comprising synthesizing an object contour of said object within the image.

3. The method of Claim 1, further comprising synthesizing a rotated binary image chip of said object within the image.

4. The method of Claim 1, further comprising synthesizing a symmetrically rotated binary image chip of said object within the image.

5. The method of Claim 2, wherein synthesizing said object contour of said object within the image comprises:

producing a binary image of the image; and

extracting an outer edge of the binary image.

6. The method of Claim 2, wherein synthesizing said object contour of said object within the image comprises:

producing an edge image of the image; and

extracting an outer edge of the edge image.

7. The method of Claim 5, further comprising:

generating a coordinate list of said outer edge of said binary image, said coordinate list specifying a bounding region enclosing said object within the image;

extracting an image chip from the image corresponding to said bounding region specified by said coordinate list;

generating a binary image chip of said image chip; and

conforming said binary image chip to a symmetrical axis to produce said object contour.

8. The method of Claim 6, further comprising:

generating a coordinate list with said outer edge of said edge image, said coordinate list specifying a bounding region enclosing said object within said image;

extracting an image chip from the image corresponding to said bounding region specified by said coordinate list;

generating a binary image chip of said image chip; and

conforming said binary image chip to a symmetrical axis to produce said object contour.

9. The method of Claim 7, wherein generating said coordinate list of said outer edge includes:

comparing the dimension of said bounding region to predetermined validation dimension; and

validating said object if the dimension of said bounding region is less than said predetermined validation dimension.

10. The method of Claim 8, wherein generating a coordinate list of said outer edge includes:

comparing the dimensions of said bounding region to predetermined validation dimensions; and

validating said object if the dimensions of said bounding region is less than said predetermined validation dimensions.

11. The method of Claim 7, wherein said symmetrical axis is a vertically symmetrical axis.

12. The method of Claim 8, wherein said symmetrical axis is a vertically symmetrical axis.

13. The method of Claim 1, wherein recognizing said object within the image further comprises recognizing said object within the image as a member of a first object sub-class of said first object class if said object substantially meets said first object criteria of said first object class and said first sub-class object criteria of said first object sub-class.

14. The method of Claim 1, wherein compressing at a first coding rate said first region of the image having said object recognized as said member of said first object class comprises:

constructing a wavelet mask that provides a mapping of said first region of the image having said object recognized as said member of said first object class;

grouping subbands of said image into a first subband class sequence and a second subband class sequence according to said wavelet mask;

encoding said first subband class sequence at said first coding rate; and

encoding said second subband class sequence at said second coding rate.

15. The method of Claim 14, further comprising normalizing said first subband class sequence.

16. A apparatus for recognizing and compressing an image such that a requirement for the transmission of the image is reduced while maintaining target-specific utility of the image, comprising:

an object processor configured to receive the image and synthesize an object existing within the image;

a classification engine configured recognize said object existing within the image as a member of a first object class if said object substantially meets first object criteria of said first object class that is at least partially related to the target-specific utility of the image; and

a multi-rate encoder configured to compress a first region of the image having said object recognized as said member of said first object class at a first coding rate, said first coding rate providing a first coding resolution of said first region that is greater than a second coding resolution provided by a second coding rate for the image.

17. The apparatus of Claim 16, wherein said object is synthesized to form a rotated binary image chip of said object existing within the image.

18. The apparatus of Claim 16, wherein said object is synthesized to form a symmetrically rotated binary image chip of said object existing within the image.

19. The apparatus of Claim 16, wherein said object processor comprises:

a binary image generator configured to receive the image and produce a binary image of said object; and

an outer edge extractor configured to extract an outer edge of the binary image and generate a coordinate list with said outer edge that specifies a bounding region enclosing said object existing within the image.

20. The apparatus of Claim 16, wherein said object processor comprises:

an edge image generator configured to receive the image and produce a edge image of said object; and

an outer edge extractor configured to extract an outer edge of the edge image and generate a coordinate list with said outer edge that specifies a bounding region enclosing said object existing within the image.

21. The apparatus of Claim 19, further comprising:

an object extractor configured to extract an image chip from the image corresponding to said bounding region specified by said coordinate list;

a binary chip image generator configured to generate a binary image chip of said image chip; and

a symmetrical rotator configured to conform said binary image chip to a symmetrical axis to produce said object.

22. The apparatus of Claim 20, further comprising:

an object extractor configured to extract an image chip from the image corresponding to said bounding region specified by said coordinate list;

a binary chip image generator configured to generate a binary image chip of said image chip; and

a symmetrical rotator configured to conform said binary image chip to a symmetrical axis to produce said object.

23. The apparatus of Claim 16, wherein said multi-rate encoder comprises:

a wavelet mask constructor configured to construct a wavelet mask that provides a mapping of said first region of the image having said object recognized as said member of said first object class;

a subband-class sequence generator configured to group subbands of said image into a first subband class sequence corresponding to said first region having said object recognized as said member of said first object class and a second subband class sequence according to said wavelet mask; and

an encoder configured to encode said first subband class sequence at said first coding rate and said second subband class sequence at said second coding rate.

24. The apparatus of Claim 23, further comprising a normalizer configured to normalize said first subband class sequence.